

Research Note:  
Global H2 Communications  
State of the Sector

Prepared for the Australian Hydrogen Council

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## Overview

The purpose of this research note is to summarise where the global hydrogen sector is in terms of actively developing and communicating their H2 activities. Communication is part of building and maintaining social license profile with a broad range of stakeholders from government and industry, to local community members. Countries surveyed are: Australia, Canada, France, Germany, Japan, South Korea, the UK, and the USA (California). Collective EU developments are also included. Overall, information on H2, from how it's made to how it could be used, is remarkably similar from one country to another. The information provided in this document is deceptively sparse given the substantial time spent scouring the internet for H2 communication strategies. What limited information is available at 14 July 2021 is indicated within.

## H2 Frontrunner

Although H2 technologies are underway for a range of applications across residential, business, mobility, manufacturing, export, and hard-to-abate industries, there is a clear 'front runner' in terms of H2 communication darlings. With the exception of Australia, the global hydrogen sector is focusing on hydrogen mobility in the form of light vehicles, buses, forklifts, and trucks plus associated infrastructure. Mid-term plans for H2 powered mobility include avian and maritime transportation with appropriate infrastructure at airports and marine ports. Australia is focusing on hydrogen production, more broadly, for a range of purposes – not just mobility.

There are three reasons for a mobility focus:

- (1) Introducing new products to a market as replacements for products that have a limited lifespan in the first place means there is a lower financial hurdle in terms of stranded assets
- (2) Consumers are more psychologically conditioned to look for advances in mobility technology as a positive characteristic when purchasing or leasing new vehicles. As such, they are less likely to resist change as long as the perceived benefits and costs of the new mobility technology are an improvement over their current mobility solution.
- (3) Globally, transportation is responsible for 23% of GHG emissions. It is therefore an easier and quicker 'win' for national governments to encourage and invest in H2 mobility which paves the way for the longer term, and potentially more contentious, transition away from fossil fuel-generated power responsible for 40% of GHG emission (coal - 29%, gas-9%, oil – 2%) ([IEA 2021](#)).

One would expect that there are robust communications strategies around H2 mobility including websites, media campaigns, fact sheets, and more to support the adoption of H2 mobility solutions. More broadly, one would expect that each of the named countries would have a well-articulated and distributed National Hydrogen Strategy that is being actively promoted across a broad range of stakeholders within government, industry, communities, and any number of potential domestic or international consumers. Even though hydrogen strategies are available, coordinated communications about them are not.

## H2 Communications – State of the Sector

There is no evidence of active, well-articulated, intentional H2 communication campaigns, as such.

H2 communication assets – where they exist – are currently very much in their infancy and do not seem to have been actively or widely distributed. For the most part, the FAQs, white papers, reports, and some very limited videos, sit rather passively on various government, industry champion, and

peak body websites. There are media announcements of MoUs between countries, as well as of major funding announcements. However, no country surveyed has a coherent communication roadmap either published or enacted. Without clear policy signals, a public appetite, products ready for market, infrastructure in place, and robustly proven demonstration projects, there is not much that can be shared. In many ways, the sector is on the cusp of a communications juggernaut, it is just not ready to 'go there' yet.

Given the state of investment in R&D and demonstration projects, and the fact that most of these projects are – at their most advanced – in construction phase, it is unlikely that there will be a need for wide-ranging communications strategies ahead of 2023. This gives the sector about 18 months to work out a multi-stakeholder communication plan inclusive of but also outside of government, industry, and academia.

At the moment, the communications within this group of stakeholders appears *ad hoc*, dynamic, and – with the exception of commercial-in-confidence content – quite open. The COVID digital environment has created broader than usual access to a diverse number of webinars, conferences, ministerial pronouncement events, and workshops. A sampling of this content is available on YouTube and more content is available only to people who are registrants of the various events. However, there does not appear to be a directory or list of any kind where hydrogen-focused events are either curated or advertised.

### Methods and high-level observations

In preparing this research note, a wide variety of search terms were systematically applied over the space of 2 months. Surveyed sources include: government websites; industry websites; academic journals; peak body websites; social media; YouTube; research centre websites; industry-facing magazines; and, peak body websites. Given the substantial amount of time invested, one would expect to have found evidence of robust communication strategies in place. However, there appear to be none. This situation may change – and rapidly – as H2 developments continue to charge along. An overview of sources and findings is below.

- **Academic Literature:** Literature is limited to some embryonic efforts to collect information on hydrogen activity. However, these articles seem to be more historical retrospectives and are missing the most recent year or two of data owing to time lags inherent to publication timelines. There are generous suggestions for further research, but no prescriptions for action. In short, communication and social license strategies – specific to hydrogen – are not yet being discussed in the academic literature. A collection of available academic resources has previously been submitted to the AHC for consideration and are not included in this research note.
- **Government websites:** Where in English, these have the most information. Some of the government published information is captured on HyResource. However, that website – though very valuable - is a heavily edited resource curated to highlight similar, or comparable, documents. HyResource creates a deceptively comforting sense of consistency across the Hydrogen sector, which does not actually reflect the wide variations of activity, reflecting either lack of information or focus, across jurisdictions. With the exception of some hydrogen strategies, government documents linked here are not on HyResource.
- **Industry / R&D websites:** These websites are all very aspirational in tone. From Kawasaki Industries, to River Simple, to the various Hydrogen research hubs around the globe, there is a very clear future focus. The websites tend to feature blue and green colours, with widely

spaced (e.g., lots of white space) descriptions of what various industry partners and research consortia are in the process of developing. Owing to the commercial-in-confidence nature of their activities, details beyond “what is hydrogen” and “what is our big picture plan” are not typically available (at least in English). There are no active communication strategies evident, and the quality / content of the websites varies widely from pleasantly appealing to unhelpfully ugly. A sample of these websites included in the tables in this research note. A more detailed analysis on Industry & R&D websites may be desirable under a separate brief.

- **Social Media / YouTube:** There is no useful content regarding hydrogen communication strategies on social media outside of LinkedIn. LinkedIn hydrogen communications appear to be focused on promoting webinars, conferences, announcements of project launches, promotions of industry leaders, milestone achievements, and similar. LinkedIn does not allow data harvesting of material on its platform, so its utility as a research resource is quite limited. This research note *does* contain a selection of YouTube videos, by country. However, the videos demonstrate a very basic approach to communication. The audience for most of these videos is certainly not the general public and is instead more focused on government, industry, and hydrogen enthusiasts. Videos are linked on the country pages where available in English.
- **Industry-facing Magazines:** Where not behind a paywall, only a limited number of these resources were able to be explored. By their very nature, these publications are not focused on communication to the wider public. Their collective focus is on technology innovations, R&D collaborations, and jobs. Topics pertinent to social license and environmental issues are all but absent. Given the current content foci, it is premature to add links to these magazines in terms of their utility for H2 communications strategies, so they are not included here.

### Which country has the most holistic hydrogen communications?

The country with the most holistic communications assets is Japan. Unlike other countries surveyed for this project, Japan had an unparalleled incentive to be a first mover on hydrogen that other countries did not: the Fukushima Daiichi nuclear meltdown ([2011](#)). Although this incident was also a powerful motivator for England and Germany to revisit and begin the process of winding down their own nuclear programs [1, 2], the effect on Japan’s forward energy plans was more significant [3].

Japan is highly motivated to move away from nuclear energy and remain carbon neutral. Its communication assets champion H2 economy plans as interlinked with the plans of other countries, especially Australia & Canada. That said, evidenced only by English language resources, it is still too early for the Japanese government to actively market hydrogen outside of industry, investment, and policy circles. Nevertheless, examples of English and Japanese language materials are provided in the appendix.

### Advice for Australia

What does the apparent absence of multi-stakeholder communication campaigns mean for Australia’s emerging hydrogen sector? So far, there is no best practice to emulate, no leader to chase, and no lessons to learn from other countries in terms of communicating emerging hydrogen developments to a wide range of stakeholders in either a methodical, sequenced (or even disorganised) way. Therefore, the Australia’s H2 sector will need to look to analogous products or other periods of energy transition to guide communications timing and depth of content.

One caveat does emerge from energy transition scholarship, covered in earlier communications with the AHC. Communicating for the wrong phase of an energy transition both erodes the power of the message as well as trust in both the messenger and the sector. As evidence for this point, no country is yet willing to begin ‘selling’ H2 solutions to their citizens and businesses before there is a product closer to demonstration, much less market. Even with H2 mobility solutions actively in demonstration mode in Japan, South Korea, California, and Europe, the overwhelming focus is on attracting public and private infrastructure development funding rather than on creating a consumer market for the products. The consensus seems to be that until the supply of H2 vehicles and refuelling stations is established and proven reliable, as well as economically accessible for more than comparatively wealthy early adopters [4], it’s not an auspicious time to stimulate market demand.

Finally, there is no evidence yet to characterise a ‘Goldilocks zone’ for hydrogen. This situation may change rapidly, at very little notice and potentially in the near future, if sector developments continue accelerating. Consequently, the communications space needs to be regularly monitored for any breaking advancements. As soon as there is a clear ‘first mover’ with messaging that connects with community and business stakeholders – either positively or negatively – there will likely be swift copycat or alternate messaging developed.

Since the current state of hydrogen communication is in its early development phase, there is currently room for Australia’s governments and industry leaders to design a harmonised communication roadmap. Australia could potentially become a regional or industry exemplar in terms of socialising its hydrogen ambitions beyond insider circles. Early communications around a harmonised and sector-wide Australian Certificate of Origin scheme provide one model for how communications, around the hydrogen sector, more generally, might be developed and distributed.

The balance of this research note provides a one-page overview for each country as to their H2 ambitions and their respective foci. Links to H2 assets, where available, are included for illustration purposes. This document supplements information available on HyResource, and where available, provides links for FAQs and factsheets per country (not per research group or industry champion).

## COUNTRY SUMMARIES

During the research period, it became clear that there is a universal need for a hydrogen information hub. Right now, the sector is very fragmented. There are a couple of websites that have endeavoured to collect information about the state of hydrogen development on a per country basis.

The first website belongs to the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE). This site is **not** listed on HyResource. Although this website has the most salient information behind a paywall (for the use of sponsoring government employees only), there is a publicly available infographic for each country with Hydrogen aspirations. Links for FAQs are embedded on the country names below for a snapshot of current developments as at the date listed. Below each snapshot are a summary of developments.

The second website belongs to the better-known International Energy Agency (IEA), which is listed on HyResource. However, HyResource does not feature links to IEA country profiles. They are below. Each country's energy profile is broken down by resource with an easy link to hydrogen developments in the prominent blue dialogue box on each country front page. The information on this website is primarily quantitative but provides a methodically coherent picture of comparable statistics across countries. Although there is no communications profile data available here, hydrogen trends and aspirations of each country are reflected.

These two sites might be good to triangulate with HyResource to develop depth of understanding across jurisdictions:

IPHE	IEA
<a href="#">Australia</a>	<a href="#">Australia</a>
<a href="#">Japan</a>	<a href="#">Japan</a>
<a href="#">South Korea</a>	<a href="#">South Korea</a>
<a href="#">USA</a>	<a href="#">USA</a>
<a href="#">UK</a>	<a href="#">UK</a>
<a href="#">Canada</a>	<a href="#">Canada</a>
<a href="#">EU</a>	<a href="#">EU</a>
<a href="#">France</a>	<a href="#">France</a>
<a href="#">Germany</a>	<a href="#">Germany</a>

## Australia

### Communication Assets

Each jurisdiction and H2 project appears to have its own, stand-alone communication assets. This is potentially a barrier to social license, more broadly, as slightly different messaging runs the risk of confusing both businesses as well as the good Australian people. Standard “Hydrogen Basics” assets would be helpful in terms of harmonising core messaging whereas project related assets can be developed and shared separately.

H2 FAQs	<a href="#">Aurecon</a>	<a href="#">PwC</a>	<a href="#">Deloitte</a>	<a href="#">Woodside</a>	<a href="#">Australian Government</a>	
Mobility / Transport	<a href="#">Hydrogen Society of Australia</a>	<a href="#">Mirai FAQs</a>	<a href="#">Royal Auto Clubs</a>	<a href="#">Hyundai Nexo FAQs</a>		
Infrastructure	<a href="#">CSIRO H2 Industry Mission</a>	<a href="#">ARENA Hydrogen</a>				
Power generation	<a href="#">Geoscience Australia</a>					
CCS	<a href="#">Victoria State Gov't</a>	<a href="#">CSIRO</a>	<a href="#">NSW State Gov't</a>	<a href="#">Aus Gov't Flagships</a>	<a href="#">Western Australia</a>	

### Video collections:

Woodside:	<a href="#">All about hydrogen</a> (2018)
Jemena	<a href="#">Power to Gasv</a> (2018)
ARENA	<a href="#">Hydrogen Energy Playlist</a> (2018) <a href="#">Green Hydrogen</a> (2019)
Australian Government	<a href="#">Australia's Hydrogen Opportunity</a> (2019)
Fortescue Metals	<a href="#">Andrew Forrest Talking about H2</a> (2021)
AGIG	<a href="#">HyP SA</a> (2021)

### Policy settings

As at July 2021, H2 policy settings are not well-developed. Each state and territory in Australia is developing its own hydrogen strategy and initiatives, as a national action plan is currently missing at the federal level. The Hydrogen Strategy and Technology Roadmap are both helpful, nationally, and the federal government has made generous economic incentives available through ARENA and other funding schemes. However, there remains a reticence by the current federal government to commit to a firm decarbonisation strategy that explicitly sets national policy and production targets featuring hydrogen. Until policy settings are more clear, communication plans could be hampered.

### H2 Focus

In contrast to other H2-aspiring countries, Australia is fixated on H2 power stations and export. This may end up being a net advantage in terms of GDP and releasing R&D investment dollars. However, it's worth noting that, compared to other countries, H2 mobility is currently under-explored in Australia. When the AHC was H2 Mobility / Australia, there was a natural focus point. Now that the AHC has an expanded remit under the National Hydrogen Strategy, there is no singular champion for H2 mobility, as there is for green steel (e.g., Twigg Forrester), decarbonised electricity (e.g., AGIG, ENA), and similar. Currently, Hydrogen Society of Australia aspires fill this gap in Western Australia as at the link above (note: poor quality video).



## Communications Best Practice in the H2 Sector

### Japan

2017 – [National Hydrogen Strategy](#)

2019 – [Strategic Road Map for H2 and Fuel Cells](#)

2020 – [Green Growth Strategy through Carbon Neutrality by 2050](#)

2020 – [Updated Hydrogen Strategy](#)

#### Communication Assets

The documents below are general in nature – and target government, industry, and hydrogen enthusiasts. There is simply not a lot of material available in English as at July 2021. That said, the information Japan has produced is the most comprehensive and clearly articulated across the hydrogen value chain. There is not a wide range of websites with communication assets, but the assets available are of high quality and well composed. **The H2 FAQs material is reproduced in the Appendix.**

H2 FAQs	<a href="#">Hydrogen Society</a>	<a href="#">Hydrogen Supply Chain</a>				
Mobility / Transport	<a href="#">JHyM</a> (needs to be translated)					
Infrastructure	<a href="#">JH2A</a> (Japan H2 Ass'n)					
Power generation	<a href="#">Carbon Neutral Goal</a>	<a href="#">Hydrogen Road</a>				

#### Video collections:

Ministry of Environment (MoE)	<a href="#">Projects to Create a H2 Society</a> (2020)
Prime Minister's Office	<a href="#">Hydrogen Energy in Japan</a> (2020)
Toyota Mirai	<a href="#">Production of H2 Car</a> (2021)
Canada/Japan H2 export	<a href="#">Understanding the Japan Hydrogen Market</a> (2021)
Australia/Japan H2 export	<a href="#">HESC Project</a> (2018)
Kawasaki Industries videos	<a href="#">Collection related to HESC project</a> (2020)
Consulate General of Japan	<a href="#">Role of Hydrogen Energy</a> (2021)

#### Policy settings

Japan is heavily invested in making sure that their economy meets the 2050 Paris climate goals. Of all hydrogen-aspiring countries, Japan has the most coherent plan with the appropriate policy settings to make it happen. Links above are to documents which provide further details.

#### H2 Focus

Japan is focusing on mobility first and will roll out hydrogen and renewable solutions as available to meet the targets they have set. Explicitly targeted SDGs include: 7 (Clean Energy), 9 (Industry, Innovation, Infrastructure), 11 (Sustainable Cities), 12 (Responsible Production/Consumption), 13 (Climate Action), 17 (Partnership for the Goals)

## Communications Best Practice in the H2 Sector

### South Korea

2018 – [Roadmap for Hydrogen Economy – FCEV Production](#) (via Hyundai)

2019 – [Hydrogen Roadmap for Korea](#) (Republic of Korea)

2021 – [Hydrogen Roadmap](#) (via UK report)

#### Communication Assets

South Korea has the fewest government sponsored assets of all the countries surveyed. This is an unexpected result as South Korea is making well-financed plans to import hydrogen from Australia. Of the English language information available, most of the information about Korea’s hydrogen aspirations was not published on government websites but via third parties. There is not much available at the moment as indicated below.

H2 FAQs	<a href="#">AKBC Discussion Paper</a> with FAQs	<a href="#">Clifford Chance Report</a>				
Mobility / Transport	<a href="#">Hydrogen Society of Australia</a>					
Infrastructure	<a href="#">Hydrogen Society</a> (+ Int’l partners)					

#### Video collections:

Hyundai

Edmonton Global

[Nexo H2 Powered Car](#) (2021)

[Understanding Korea’s Hydrogen Market](#) (2021)

#### Policy settings

Korea is strongly supportive of developing their hydrogen sector and appears to have thrown support behind their national business groups (e.g., Hyundai) who are spear-heading hydrogen activity.[5] Policy settings outside of the national strategy are not yet available in English.

#### H2 Focus

From the information available, it appears Korea is single-focus minded on mobility and associated infrastructure. They are very much following the lead of Japan and California in this regard.

California / USA

2018 – [California’s Fuel Cell Revolution](#)

2021 – [Roadmap to a US Hydrogen Economy](#)

2021 – [New H2 Plan under legislation](#) (California)

**Communication Assets**

California’s hydrogen communication assets are largely compiled and distributed by the California Hydrogen Business Council. There is a catalogue of resources in the top left-hand corner link which covers a range of fact sheets, reports, and presentations. A selection of these are indicated in the table below. Overall, the fact sheets from California are ‘stand alone’ and do not have the comprehensive ‘vision’ that Japan’s fact sheets do. A sample of Fact Sheets are indicated in the appendix.

<a href="#">H2 FAQs Comprehensive</a>	<a href="#">Heavy Duty Trucking</a>	<a href="#">Hydrogen FAQs CEC FAQs</a>	<a href="#">Zero Emission Power</a>	<a href="#">Fuel Cell Buses</a>	<a href="#">H2 &amp; Fuel Cells Fuel Cells &amp; Retail</a>	<a href="#">Flexible Load</a>
Mobility / Transport	<a href="#">H2 Vehicles &amp; Refuelling</a>	<a href="#">FLIRT H2 train</a>				
Infrastructure	<a href="#">DoE H2 Program Plan</a>	<a href="#">Shell Hydrogen</a>				
Power generation	<a href="#">H2 @ Scale (Dept of Energy, DOE)</a>	<a href="#">Deep decarbonisation</a>				
CCS	<a href="#">Status of CCS</a>					

**Video collections:**

- CHBC [Collection of Webinars and Videos](#) (2017 – 2020)
- Hydrogen Policy Briefing [California Hydrogen Policy Series](#) (2020)
- California Fuel Cell Partnership [Resource Library](#) (2021)

**Policy settings**

California’s policy settings are very much supportive of the R&D and demonstration phases of a robust hydrogen mobility sector and back-up power supply solutions. There is a great deal of lobbying activity underway. Until California develops its policy settings either on its own or in counterpoise to US National policy, the hydrogen sector will continue to languish at a pre-market level.

**H2 Focus**

California’s hydrogen focus is currently on mobile assets. Secondly, California is hoping that hydrogen will have capacity to firm the grid during periods of power outage. A concern about stationary H2 assets is how they would function under conditions of wildfires, which affect current power providers. Another impediment is that the State of California has been impeded by federal restraints. Until July 2021, hydrogen was hampered by lack of support of the executive and legislative branches of government. [President Biden’s recent announcement](#) of support for hydrogen and fuel cells will likely bring welcome change to California’s hydrogen aspirations as well as those around the United States.

Canada

2020 – [Hydrogen Strategy for Canada](#)

**Communication Assets**

Canada’s communication assets are fairly basic, even though some of them date back to the early 2000s. Communications are dominated by the CHFCA which has a very technical editorial bias. There is little in these fact sheets and FAQs that would be engaging outside of the government / industry nexus. The Government of Canada resources are marginally more appealing, but also lack appeal to a broader audience. Examples are included in the appendix. The videos are quite well made and are good exemplars, especially the AIHA clip.

H2 FAQs	<a href="#">CHFCA – H2 facts</a>	<a href="#">CHFCA – H2 Cities – Fact sheet</a>	<a href="#">Green Hydrogen (Thyssenkrupp)</a>	<a href="#">The need for clean energy</a>		
Mobility / Transport	<a href="#">FCEB’s Fact Sheets</a>	<a href="#">FCEVs, Trains, Trucks, Buses</a>	<a href="#">Fuel Cells</a>	<a href="#">Fuel Cells (2)</a>		
Infrastructure	<a href="#">Refuelling infrastructure</a>	<a href="#">Enbridge</a>	<a href="#">Air Products</a>			
CCS	<a href="#">Q&amp;A by Shell</a>	<a href="#">Int’l CCS Knowledge Centre</a>				

**Video collections:**

- Enbridge [The Gas of the Future \(2020\)](#)
- About Pipelines [Canadian Pipelines: Ready for a Hydrogen Future \(2021\)](#)
- Hydro to Hydrogen [Canada to use Dams to power Huge H2 Fuel Plant \(2021\)](#)
- AIHA [Alberta’s Hydrogen Future \(2021\)](#)

**Policy settings**

In 2021, Canada is putting a heavy policy emphasis on scaling up the hydrogen sector for export which includes generous, but socially divisive, incentives for CCS. To encourage corporate investment in blue hydrogen projects, the government is encouraging private companies to work together in RD&D projects to share knowledge and ideally move away from blue hydrogen in the medium to longer term. Carbon pricing is one policy lever in this effort. Canada is also creating policy support for robust investment in renewables, especially hydro as well as wind energy in the arctic circle. Presumably, the renewable energy will be used to make green hydrogen at some point. However, the wind angle remains a puzzling choice as the turbine technology has yet to be proven in consistently freezing conditions. What Canada is missing at this point is a [supportive regulatory framework](#) which is meant to be developed in the first phase of the Hydrogen Strategy.

**H2 Focus**

In addition to decarbonising hard-to-abate transport and industry, Canada aspires to create enough hydrogen to reduce reliance on coal, oil and gas, as well as to produce enough hydrogen for export to Germany, South Korea and Japan. Crucially, Canada’s hydrogen ambitions are heavily depended on blue hydrogen and a large-scale CCS program – which has yet to be proven.

EU

2020 – [European Commission Hydrogen Strategy](#)

**Communication Assets**

The EC’s communication strategy is largely targeted to member states to build a coalition of hydrogen infrastructure development.

H2 FAQs	<a href="#">Mobility FAQs</a>	<a href="#">European Green Deal FAQs</a>	<a href="#">H2 Strategy Fact Sheet</a>	<a href="#">H2 and H2O fact sheet</a>	<a href="#">CertifyHY FAQs</a>	
Mobility / Transport	<a href="#">Hydrogen Mobility Europe</a>	<a href="#">Sustainable and Smart Mobility</a>	<a href="#">FCEBs knowledge base</a>			
Infrastructure	<a href="#">European Hydrogen Backbone</a>	<a href="#">Gas Infrastructure Europe</a>	<a href="#">EU Hydrogen Act</a>			
Power generation	<a href="#">Comprehensive EU Plan – Position paper</a>					

**Video collections:**

- |                   |   |
|-------------------|---|
| Guidehouse        | <a href="#">EU Hydrogen Backbone</a> (2020)       |
| Natural Gas World | <a href="#">The EU’s Hydrogen Strategy</a> (2020) |
| Hydrogen Europe   | <a href="#">Resources Library</a> (2021)          |

**Policy settings**

The EC’s mobility aspirations will require full-throttle policy support as well as robust environmental standards and regulations coupled with the swift deployment of renewable and low-carbon fuel. A significant weakness in the EU plan is maritime and aviation transport (including sea- and air- ports) which have no current options for decarbonised fuel. Significant R&D as well as economic incentives / investment are required to bring these two sectors into alignment with the rest of the EU’s multi-modal, cross-border planning. The plan for H2 to replace coal, oil and gas more holistically (not just in the transport sector) is still developing.

**H2 Focus**

The European Union is prioritising Mobility aspirations / The European Green Deal ([roadmap](#)):

<p>By 2030:</p> <ul style="list-style-type: none"> <li>• at least 30 million zero-emission vehicles will be in operation on European roads.</li> <li>• 100 European cities will be climate neutral.</li> <li>• high-speed rail traffic will double.</li> <li>• scheduled collective travel of under 500 km should be carbon neutral within the EU.</li> <li>• automated mobility will be deployed at large scale.</li> <li>• zero-emission vessels will become ready for market</li> </ul>	<p>By 2035:</p> <ul style="list-style-type: none"> <li>• zero-emission large aircraft will become ready for market.</li> </ul>	<p>By 2050:</p> <ul style="list-style-type: none"> <li>• nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero emission.</li> <li>• rail freight traffic will double.</li> <li>• high-speed rail traffic will triple.</li> <li>• the multimodal Trans-European Transport Network (TEN-T) equipped for sustainable and smart transport with high speed connectivity will be operational for the comprehensive network.</li> </ul>
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## Communications Best Practice in the H2 Sector

### UK

2005 – [Fuel Cell Development and Deployment Roadmap](#)

2021 – Hydrogen Strategy ([Set for publication 22 July](#))

#### Communication Assets

The UK, like the Republic of Korea, is deferring government announcements about hydrogen preferring to let major industry partners make announcements and lead messaging. Interestingly, the UK has more information about CCS than about hydrogen, probably owing to its long history of coal use.

H2 FAQs	<a href="#">Leeds Project FAQs</a>	<a href="#">UK H2 mobility FAQs</a>	<a href="#">HSBC FAQs H2 investing</a>			
Mobility / Transport	<a href="#">UK H2 Mobility</a>	<a href="#">Riversimple</a>				
Infrastructure	<a href="#">Leeds Project</a>					
Power generation	<a href="#">Equinor Saltend Project</a>	<a href="#">Deloitte UK</a>				
CCS	<a href="#">CCUS commitments</a>	<a href="#">CCU Demonstration Program</a>	<a href="#">CCUS business models</a>			

#### Video collections:

Leeds City Gate	<a href="#">Northern Gas Networks H21</a> (2018)
ITM Power	<a href="#">How to refuel H2 Vehicle</a> (2018)
Equinor Saltend	<a href="#">Blue Hydrogen and CCS</a> (2019)
Riversimple	<a href="#">Hydrogen mobility</a> (2019)
Scotland's Ambitions	<a href="#">Hydrogen – Pipeline to the Future</a> (2020)

#### Policy settings

Since the UK withdrew from the EU, it is revisiting a series of policy matters related to energy as well as other sectors. The main policy positions are listed on [HyResource](#) and nothing further of note was found. The UK is, naturally, not participating in the EU hydrogen cooperative agreements.

#### H2 Focus

The UK seems to be focusing on replacing coal and nuclear power plants in the first instance and supporting hydrogen mobility in the second. However, the government is being exceptionally tight-lipped about how it plans to roll out these ambitions. Hopefully, the 'soon to be released' hydrogen strategy will shed more light on the UK's plans.

## France

2020 – [Draft National Strategy for decarbonised and renewable hydrogen network](#)

2020 – [French Green Hydrogen Plan 2020-2030](#)

2021 – [French Strategy for renewable and low-carbon hydrogen development](#) (English)

### Communication Assets

Most of the information about France is, as might be expected, in French. To read them, navigate to the links using Google and select ‘translate’, where they can be viewed in English. There are a few resources in English as noted. Although not many, the videos on hydrogen have the edgiest music and editing of the videos collected in this research note.

H2 FAQs	<a href="#">H2 Factsheets</a>	<a href="#">Green H2 fact sheet</a>	<a href="#">History of H2</a>	<a href="#">Air Liquide</a>		
Mobility / Transport	<a href="#">Mobility H2 France</a>	<a href="#">SNCF - Trains</a>	<a href="#">Renault Hydrogen Mobility</a>			
Infrastructure	<a href="#">Overview of H2 Strategy</a> (in English)					
Power generation	<a href="#">Hydrogen + Nuclear</a> (in English)					

### Video collections:

Hydrogen Exhibition	<a href="#">Lighting up the Eiffel Tower with Hydrogen</a> (2021)
SNCF (French Trains)	<a href="#">Pioneering order for Hydrogen Trains</a> (2021)
H2 Mobility (Hopium)	<a href="#">Hopium Machina Alpha</a> (2021)

### Policy settings

France has recently released a [new legal framework](#) to scaffold the investment of 7 billion euros into the emerging hydrogen sector. This legal framework will guide both policy development and clarify the business case for power-to-gas, electrolysis, steam reforming, and electricity supply strategies. The legal framework is seen, by the French, as the precursor to a policy framework since policy will not work if not supported by French law. This is a new space in 2021 and requires further observation.

### H2 Focus

France is focused on industrial uses for hydrogen including hard-to-abate sectors such as heavy-duty trucking. Interestingly, and unlike other jurisdictions, the French articulate hydrogen as part of a three-pronged approach to decarbonise. They continue to include nuclear but also add biofuels into the mix. As with Germany, France is a major influencer on the EU plan to decarbonise mobility including cars and trains in the short to medium term. As well, France is a prime mover behind the European [Guarantee of Origin Scheme](#) that is being negotiated.

## Germany

### 2020 – [National Hydrogen Strategy](#)

#### Communication Assets

Most of the information about Germany is currently only available in the energy press, and needs to be run through translation software. Germany is not focused on producing English language assets except for when required for German companies operating internationally (e.g., Thyssenkrupp in Canada).

H2 FAQs	<a href="#">German Gov't</a>					
Mobility / Transport	<a href="#">H2 Mobility</a>	<a href="#">NOW-GmbH.DE</a>	<a href="#">BMW</a>			
Infrastructure	<a href="#">Get H2</a>					
Power generation	<a href="#">Article on Germany's H2 plans</a>					
Projects	<a href="#">List of German projects</a>					

#### Video collections:

Thyssenkrupp <a href="#">Mission Hydrogen</a>	<a href="#">Renewable electricity – green hydrogen</a> (2018) This national body produces what it calls 'infotainment' in the form of a collections of H2-focused videos of webinars they have organised. To view, it is necessary to purchase access. A full range of topics is covered from 'What is hydrogen?', to safety, transportation, pipelines, fuel cells, renewables synergies, compression challenges, and similar.
Seimens (Germany) DW Hydrogen	<a href="#">Green Hydrogen</a> (2020) <a href="#">Hydrogen for Germany</a> (2020)

#### Policy settings

Germany aspires to retire its nuclear fleet and eliminate coal powered electricity generation. Germany is also a significant force behind the EC hydrogen strategy which is focusing on a coordinated mobility infrastructure plan that encourages trade and travel between EC member countries. Germany's policy settings are all being aligned to these priorities.

#### H2 Focus

Germany is focusing on electricity production and mobility. Germany does not aspire to generate all of its own hydrogen supply and is looking to import from [Australia](#), [Africa](#), and [Chile](#). Note as well that several regions in Germany have each declared their own hydrogen ambitions. However, most of this material is in German and presumably the most salient strategy documents are those on HyResource. It is worth noting, however, that according to most energy scholars, Germany is perhaps a more analogous country to compare with Australia than England or Canada due it configuration of states in relation to a federal government.



## The Way Forward for Australia

As is evident throughout this research note, first movers in the H2 sector amongst Australia's main trading partners are in the very early stages of developing materials to both explain and promote the H2 opportunities into which so many public and private investments are currently being made. Most of the assets are directed to industry, investment, and government audiences. Only the Japanese assets, and some of the Canadian and French videos, appear ready to scale and share with more general audiences.

Three of the active jurisdictions – outside of Australia – are very focused on H2 mobility (e.g., Japan, South Korea, California). European jurisdictions are more focused on a holistic H2 ecosystem but still prioritise mobility around which other topics are organised (e.g., guarantees of origin, the maritime sector, and creating electricity without nuclear or petroleum-based fuels). At some point, Australia will need to develop its own assets to contextualise where hydrogen powered vehicles configure in the emerging hydrogen-inclusive landscape.

### Q&As – Recommendations based on the collected assets (2021 – 2023)

Based on the very limited evidence available, Australia needs to create a set of assets to explain the following topics in a broad general way that is inclusive of industry, investors, and government but speaks to a broader constituency within the general public. Reasonably good examples addressing some of these questions are in the appendix. Not all questions have good examples available from other countries.

- + What is hydrogen and how is it made?
- + How safe is hydrogen?
- + What is the significance of different colours of hydrogen?
- + What does a Guarantee of Origin mean?
- + How do fuel cells work?
- + How will cars, trucks, buses, and trains run differently on hydrogen?
- + What kind of refuelling infrastructure will be needed to support hydrogen mobility?
- + How does hydrogen decarbonise the energy sector?
- + How can hydrogen transform cities and decarbonise their footprint?
- + How can hydrogen decarbonise maritime and aviation transportation?
- + How do renewables and biogas configure with hydrogen?

### Q&As – Next-level communication assets (2023 – 2025)

The next set of questions are typical for major industry developments in Australia but do not need to be addressed immediately, as no other country around the world is yet approaching these topics.

- + How will the hydrogen hubs support regional economies?
- + What kind of training is needed to qualify for hydrogen sector jobs?
- + What environmental protections are in place?
- + How does the export market work to support Australia's economy?
- + What are the milestones on the decarbonisation journey?

### Final Comment

Given the sheer quantity of investment funding in hydrogen around the world, it seems odd that the communication around this groundswell of activity is so underdeveloped. Despite significant effort to locate communication assets, it appears that the public-facing information on the emerging hydrogen economy is both under-stated and modest. This is a gap which will not remain unfilled for long. As projects move from being funded, to construction, to demonstration, the enthusiasm for hydrogen is likely to grow and communications will need to be articulated in parallel. At the moment, energy and automotive companies are leading the way in terms of producing easy-to-watch videos on the benefits of hydrogen.

## Communications Best Practice in the H2 Sector

The overall recommendation for Australia is to continue working with current hydrogen sector players from the various academic and commercial research groups plus government bodies. Australia's hydrogen sector would profit greatly if it worked together to design a fit-for-purpose, general hydrogen communication plan into which each hydrogen hub and major project can donate content. Similarly, each hydrogen hub – as they develop their own communications strategies – should be encouraged to link to a general hydrogen resource bank- ideally available through the AHC or a future iteration of a publicly facing section of HyResource. Further, proactive communications strategies will need to be designed and delivered in line with as yet to be developed resources around the region and the globe.

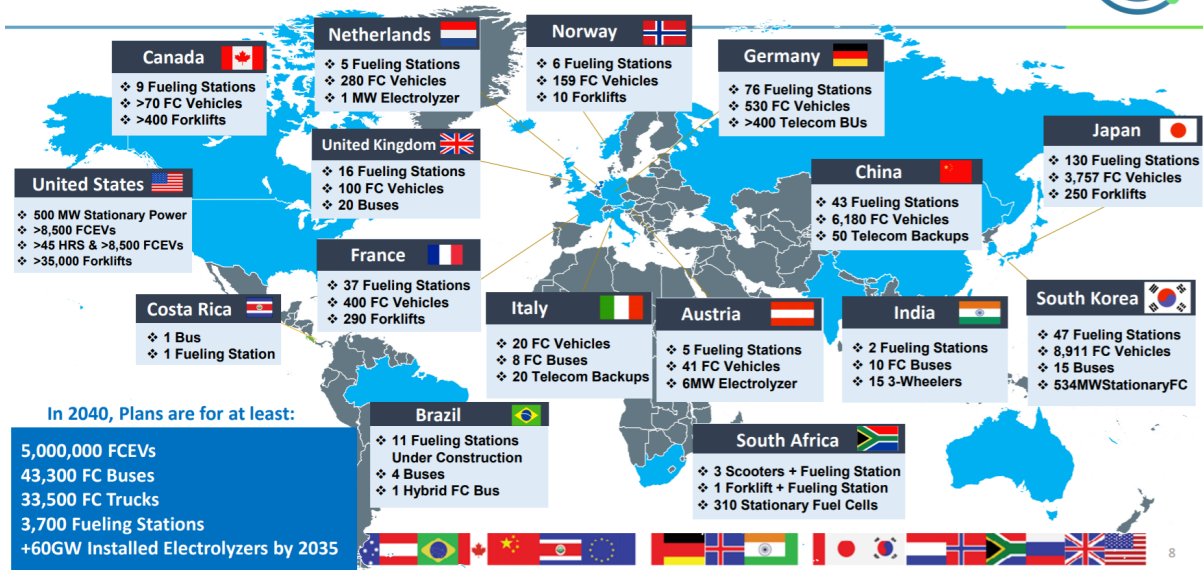
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## APPENDIX

HYDROGEN FUEL CELL GRAPHIC

Current FCH Deployments in IPHE Countries



Fuel Cell H2 Aspirations from 2020 - 2040

